REMARKS

In response to the Notice of Non-Compliant Amendment mailed January 14, 2004, the above amended claims were modified to change the identification of previously canceled claims from "(previously canceled)" to "(canceled)".

Claims 1, 2, 6-21 and 136 are presently pending in the subject application. Claims 1, 2 and 4-21 have been previously examined. Claims 1, 2, 4-14 and 16-21 stand rejected, and claim 15 is objected to. By the above amendments, claim 1 has been amended, claims 4 and 5 have been canceled without any prejudice or disclaimer of the subject matter thereof, and new claim 136 has been added. Support for the amendment to claim 1 and the addition of new claim 136 can be found throughout the specification (e.g., see page 10, lines 25-28, page 13, lines 11-15, and Examples 1-3, pages 14-15). Favorable reconsideration of the application and allowance of all of the pending claims are respectfully requested in view of the above amendments and the following remarks.

Claims 1, 2, 4-6, 10-14 and 16-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,707,735 to Midkiff et al. ("Midkiff") in view of U.S. Patent No. 5,790,926 to Mizoe et al. ("Mizoe"), U.S. Patent No. 3,928,958 to Kurata et al. ("Kurata") and U.S. Patent No. 4,369,156 to Mathes et al. ("Mathes"). Claims 1, 2, 4-6, 10-14 and 16-21 are further rejected under 35 U.S.C. § 103(a) as being unpatentable over Mizoe in view of Midkiff, Kurata and Mathes. Claims 7-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Midkiff, Mizoe, Kurata and Mathes, and further in view of U.S. Patent No. 5,759,926 to Pike et al. ("Pike"). Applicant once again acknowledges and appreciates the Examiner's indication that claim 15 contains allowable subject matter.

The cancellation of claims 4 and 5 renders the rejection of these claims moot. The rejections of the remaining claims are traversed based upon the above amendments and the following remarks.

Amended claim 1 recites a method of forming a spunbond fabric from a process employing fiber splitting in-line with fiber extrusion, including the steps of extruding an array of plural-component fibers, each including first and second materials having a relative difference in heat shrinkage of at least about ten percent, depositing the array of plural-component fibers onto a moving surface to form a web, and applying heat to the web to cause separation between segments of the plural-component fibers comprising the first material and segments of the plural-

component fibers comprising the second material due to differential heat shrinkage of the first and second materials It is respectfully submitted that no combination of the cited references renders obvious the combined features of claim 1.

Midkiff describes a method of forming multilobal conjugate fibers utilizing a spunbond process as depicted in Fig. 1. Midkiff further describes a number of conventionally known processes for splitting fibers from conjugate fibers, including needling or hydroentangling the fibers (see Col. 6, lines 14-42 of Midkiff). However, as acknowledged by the Examiner, Midkiff does not disclose the use of heat to cause the separation of fiber segments, let alone the use of first and second materials having a relative difference in heat shrinkage of at least about ten percent, as is recited in claim 1. Further, there is no disclosure or suggestion in Midkiff that the splitting of the conjugate fibers occurs in-line with fiber extrusion as is required by claim 1.

The Examiner relies on Mizoe, Kurata and Mathes to assert that it would have been obvious to substitute heat treatment of conjugate fibers for the needling process described in Midkiff. Applicant respectfully disagrees that a needling or hydroentangling process, which involves a mechanical manipulation of the fibers, can be immediately substituted with a heat process, as required by claim 1, that relies solely upon heat treatment and a heat shrinkage differential between different materials in a conjugate or plural component fiber to induce fiber splitting. However, even assuming that such a leap from hydroentangling to heat treatment could be made as asserted by the Examiner, there is still no disclosure or suggestion in Mizoe, Kurata and Mathes of providing a heat treatment process to split the fiber into separate segments in-line with fiber extrusion as is recited in claim 1.

Mizoe generally discloses forming split fibers for use in a charging member for an electrophotographic apparatus. The split fibers of Mizoe may be obtained by forming a spun product of incompatible thermoplastic resins, followed by subjecting the product to stretching and heat treatment (see Col. 5, lines 38-50 of Mizoe). There is no disclosure or suggestion in Mizoe that the stretching and heat treatment is performed in-line with fiber extrusion to induce splitting. Mathes discloses a process for preparing fibrillated fiber structures by splitting multicomponent fibers of polyamide and polyester by treatment solely with water (see Col. 2, lines 5-22 of Mathes). There is no disclosure or suggestion in Mathes that the water treatment of the fibers to induce splitting is performed in-line with fiber extrusion to induce splitting. Rather, as indicated in the Mizoe examples (see Col. 5, line 45 to Col. 6, line 55 of Mizoe), it is clear that

the water treatment to induce splitting occurs in a separate process that is not in-line with fiber extrusion.

Kurata discloses a method for producing spun yarn-like bulked yarns, where yarns including a combination of two different kinds of yarns having a difference in heat shrinkage and which have been twisted together are passed through a heater to shrink one kind of the yarns so as to impart a difference in length of 3 to 40% between the yarns, followed by passing the yarns through a rubbing device to impart a false twist in the yarns (see Col. 6, lines 37-65 and Fig. 6 of Kurata). There is no disclosure or suggestion in Kurata that the heat treatment of the twisted yarns occurs in-line with a fiber extrusion process. Further, the difference in length imparted between yarns by heat shrinkage as disclosed in Kurata is for the purpose of forming loops and snarls in the twisted yarns, thus forming a more bulky product, rather than to induce splitting of conjugate or plural component fibers into separate segments. In fact, all of the examples (see Col. 7, line 14 to Col. 8, line 56 of Kurata) clearly indicate that the polyester filament yarns that are twisted together and subjected to heat are single component filaments and not plural component fibers. Therefore, Kurata also fails to disclose or suggest separation between segments of the plural-component fibers including a first material and segments of the plural-component fibers including a second material due to differential heat shrinkage of the first and second materials, where the first and second materials have a relative difference in heat shrinkage of at least about ten percent as recited in claim 1.

Accordingly, claim 1 is allowable over any combination of Midkiff, Mizoe, Mathes and/or Kurata for at least the reasons noted above. However, in the interest of advancing prosecution, claim 1 was further amended to recite the features that heat is applied to the formed web while the web is moving in-line with the extruding and depositing steps and at a speed of from 30 meters per minute to 600 meters per minute, and that application of heat is at least one of hot air, steam, and radiant heat. There is no disclosure or suggestion in Midkiff, Mizoe, Mathes and/or Kurata of at least the feature of applying heat at a speed of 30 meters per minute to 600 meters per minute as recited in claim 1. Therefore, claim 1 should be allowed over this combination of references for this further reason.

Claims 2 and 6-21 depend, either directly or indirectly, from claim 1. Accordingly, these claims should also be allowed based upon the previous remarks.

New claim 136 is similar to the previous version of claim 1, with the additional recitation that heat is applied to the web while the web is moving in-line with the extruding and depositing steps. As noted above, no combination of Midkiff, Mizoe, Mathes and/or Kurata discloses or renders obvious these combined features, with particular regard to performing the heating step to cause separation between segments of the fibers in-line with fiber extrusion as recited in claim 136. Accordingly, this claim should be allowed.

In view of the foregoing, Applicant respectfully requests the Examiner to find the application to be in condition for allowance with claims 1, 2, 6-21 and 136. However, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to call the undersigned attorney to discuss any unresolved issues and to expedite the disposition of the application.

Filed concurrently herewith is a Petition (with payment) for an extension of time for two months to respond to the outstanding Office Action. Applicant hereby petitions for any additional extension of time that may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 05-0460.

Respectfully submitted,

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